PATENT

UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re:	Justin M. Crank	Confirmation No.:	2850
Serial No.:	10/647,613	Examiner:	Jeffrey G. Hoekstra
Filing Date:	August 25, 2003	Group Art Unit:	3736
Docket No.:	1001.1686101	Customer No.:	28075
For:	ELONGATED INTRA-LUMENAL MEDICAL DEVICE		

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REPLY BRIEF UNDER 37 C.F.R. §41.41

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By Kathleen L. Boekley
Kathleen L. Boekley

Dear Sir:

Pursuant to 37 C.F.R. §41.41, Appellant hereby submits this Reply Brief in response to the Examiner's Answer mailed March 1, 2007.

Remarks begin on page 2 of this paper.

REMARKS

The following remarks are submitted after carefully reviewing the Examiner's remarks prepared in the Examiner's Answer.

Previous Grounds of Rejection

In view of the Grounds of Rejection previously presented, Appellant renews the remarks prepared in the Appeal Brief filed on November 21, 2006.

New Grounds of Rejection

Appellant respectfully traverses the newly presented rejection of claims 1, 2, 5, 7, 9-11, 14, 16, 18, 19, 21, 22, 25, 26, 28, 29 and 32 under 35 U.S.C. §103(a) as being unpatentable over Samson et al., U.S. Patent No. 5,827,201, in view of Dobson, U.S. Patent No. 5,724,989.

Independent Claims 1 and 10

Claim 1 recites:

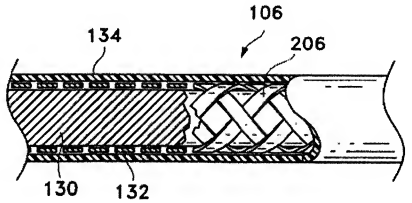
> A medical device comprising:
> a coil having a longitudinal axis and a radial axis orthogonal to the longitudinal axis, formed from a wire, the wire comprising:
> (a) a cross-section with a centroid;
> (b) a moment of inertia with respect to an axis running through the centroid and parallel to the longitudinal axis of the coil; and
> (c) a moment of inertia with respect to an axis running through the centroid and parallel to the radial axis of the coil, wherein the moment of inertia with respect to an axis running through the centroid and parallel to the longitudinal axis of the coil is greater than the moment of inertia with respect to an axis running through the centroid and parallel to the radial axis of the coil.

Claim 10, which is directed to a medical guidewire, includes similar limitations of a wire forming a coil. The claimed wire forming the coil has a cross-section such that the moment of inertia with respect to an axis running through the centroid of the cross-section and parallel to the longitudinal axis of the coil is greater than the moment of inertia with respect to an axis running through the centroid of the cross-section and parallel to the radial axis of the coil.

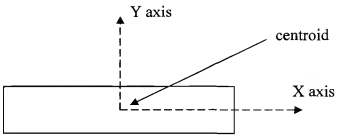
The combination of Samson et al. and Dobson do not teach an element meeting the structural limitations of the wire as currently claimed. In view of the New Grounds of Rejection,

it appears as though the Examiner is attempting to equate one of the ribbon filaments of the braid taught in Samson with the coil as currently claimed. See Examiner's Answer, paragraph 5.

FIG. 2 of Samson is reproduced below. Appellant asserts the ribbons 206 making up the braid 132 are representative of other braids depicted in the Figures of Samson and identified in the rejection.



As shown in FIG. 2, and the remainder of the Figures of Samson, the cross-section of the ribbon 206 is an elongated rectangle with the longer sides of the ribbon 206 extending along the longitudinal axis of the braid 132. This is further evidenced by Samson's express teaching that the width (longitudinal side) of the ribbon should be at least twice the thickness (radial side) of the ribbon. See Samson, at column 9, lines 57-58. An illustration of the cross-section of a ribbon 206 of a braid 132 as taught in Samson is depicted below, with the X axis corresponding to an axis running through the centroid of the ribbon 206 and parallel to the longitudinal axis of the braid 132, and the Y axis corresponding to an axis running through the centroid of the ribbon 206 and parallel to the radial axis of the braid 132.



Contrary to the Examiner's position, ribbon 206 of the braid 132 as taught in Samson fails to exhibit the claim limitations that the wire forming the coil has a moment of inertia with respect to an axis running through the centroid and parallel to the longitudinal axis of the coil which is greater than the moment of inertia with respect to an axis running through the centroid and parallel to the radial axis of the coil.

The dimensional characteristics and material distribution of the cross-section of the ribbon 206 illustrated above, as derived from the Figures of Samson, would not meet the noted claim limitations as currently claimed. Using the equations which are provided at line 7 of page 13 of the present application, one of skill in the art would conclude that the moment of inertia with respect to an axis running through the centroid of the cross-section and parallel to the longitudinal axis of the braid 132 (X axis) is less than the moment of inertia with respect to an axis running through the centroid of the cross-section and parallel to the radial axis of the braid 132 (Y axis). Thus, the ribbon 206 of the braid 132 of Samson does not exhibit the claim limitations that the wire forming the coil has a moment of inertia with respect to an axis running through the centroid and parallel to the longitudinal axis of the coil which is greater than the moment of inertia with respect to an axis running through the centroid and parallel to the radial axis of the coil.

A comparison of the cross-section of the ribbon taught in Samson and depicted above to various illustrative cross-sections provided in the present application demonstrates this understanding. Each of FIGS. 4-7 of the current application, which are reproduced below, illustrate cross-sections in which the moment of inertia with respect to an axis running through the centroid of the cross-section and parallel to the longitudinal axis of the coil (x axis) is greater than the moment of inertia with respect to an axis running through the centroid of the cross-section and parallel to the radial axis of the coil (y axis). Specific attention is directed to FIG. 4, which shows a rectangular cross-section. Dissimilar to the rectangular cross-section of a ribbon of Samson, as shown in FIG. 4, the long side (415) of the rectangular cross-section is perpendicular to the longitudinal axis (x-axis), and the short side (420) is perpendicular to the radial axis (y-axis). See Specification, at lines 23-25 of page 12.

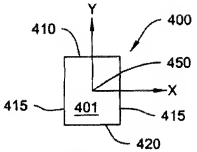


Fig.4

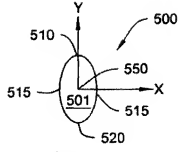


Fig.5

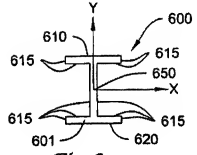


Fig.6

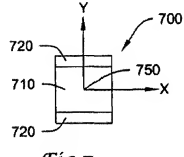
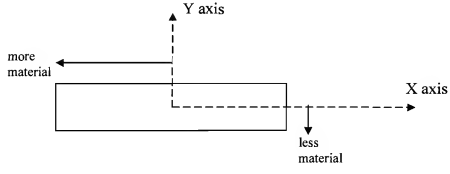


Fig.7

In order for the calculated moment of inertia about the x-axis (I_x) to exceed the calculated moment of inertia about the y-axis (I_y), a greater amount of mass must be positioned further away from the x-axis than the amount of mass positioned away from the y-axis. In each of FIGS. 4-7 more material is located further away from the x-axis than material located away from the y-axis. Dissimilarly, contrary to the Examiner's suggestion, as evidenced by the cross-section of the ribbon of Samson depicted below, more material is located further away from the y-axis than material located away from the
x-axis.



Using the equations which are provided at line 7 of page 13 of the present application, one of skill in the art would conclude that the moment of inertia with respect to an axis running through the centroid of the cross-section and parallel to the longitudinal axis (x-axis) of the braid 132 in Samson is less than the moment of inertia with respect to an axis running through the centroid of the cross-section and parallel to the radial axis (y-axis) of the braid 132 in Samson.

For at least these reasons, claims 1 and 10, as well as claims 2, 5, 7, 9, 11, 14, 16 and 18 which depend from either claim 1 or 10, are believed patentable over the rejection.

Furthermore, in response to the Examiner's argument that Samson teaches a wire having a polygonal or rectangular cross-section, Appellant respectfully notes that these claims further include the limitations of independent claims 1 or 10. As demonstrated above regarding the cross-section of the ribbon of Samson, not all polygonal or rectangular shapes result in the claimed limitations that the wire forming the coil has a moment of inertia with respect to an axis running through the centroid and parallel to the longitudinal axis of the coil which is greater than the moment of inertia with respect to an axis running through the centroid and parallel to the radial axis of the coil. For at least these reasons, the claims directed to a polygonal or rectangular shape are additionally believed to be patentable over the rejection.

Independent Claims 19 and 26

Claims 19 recites:

> A medical device comprising:
> a coil having a longitudinal axis and a radial axis orthogonal to the longitudinal axis, formed from a composite wire, the composite wire comprising:
> (a) a cross-section with a centroid, a wire longitudinal axis parallel to the coil longitudinal axis and a wire radial axis parallel to the coil radial axis;
> (b) a first material having a first Young's Modulus at the centroid; and
> (c) a second material having a second Young's Modulus further away from the centroid along the wire radial axis; wherein the second Young's Modulus is greater than the first Young's Modulus.

Claim 26, which is directed to a medical guidewire, includes similar limitations of a composite wire forming a coil. FIG. 7 of the present application, which depicts an illustrative composite wire according to the present invention is reproduced below.

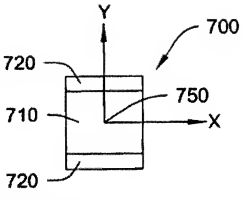


Fig.7

As shown in FIG. 7, the first material 710, which is positioned at the centroid, has a first Young's Modulus (E_1), and the second material 720, which is positioned further away from the centroid along the y-axis, has a second Young's Modulus (E_2). The materials are chosen such that the value of E_2 is greater than E_1. This arrangement of materials, as currently claimed, gives the claimed coil notable characteristics not found in the prior art. Namely, this arrangement of materials may give the coil increased torsional rigidity without sacrificing the flexibility of the coil, thereby increasing the torqueability/flexibility ratio of the coil. See Specification, at lines 16-28 of page 15.

The multi-layer wire of the spring 14 taught in Dobson does not possess the notable characteristics of the claimed coil. Namely, material distribution around the centroid of the cross-section of the spring 14 is equal in all directions. Thus, the torqueability/flexibility ratio of the spring 14 is not increased.

Appellant asserts that the teachings of Samson et al. and Dobson do not meet the structural limitations of the wire as currently claimed in claims 19 and 26. For at least these reasons, claims 19 and 26, as well as claims 21, 22, 25, 28, 29 and 32 which depend from either claim 19 or 26, are believed patentable over the rejection.

Conclusion

For at least the reasons stated above and the reasons submitted in Appellant's Appeal Brief, the rejection of claims 1, 2, 5, 7, 9-11, 14, 16, 18, 19, 21, 22, 25, 26, 28, 29 and 32 under 35 U.S.C. §103(a) should be reversed. If a telephone conference might be of assistance, please contact the undersigned attorney at (612) 677-9050.

Respectfully submitted,

Justin M. Crank

By his Attorney,

Date: 4/30/07

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